

SECTION 4: SOCIOECONOMIC CHARACTERISTICS

4.1 HISTORIC POPULATION

Population data is collected every ten years by the United States Census Bureau. Based on this data, Jefferson County experienced a period of steady growth between 1800 and 1970. Figure 4-1 shows the upward population trend of the county. Since 1970, Jefferson County's population generally stabilized and ranged between approximately 664,000 and 741,100. The future growth in Jefferson County is projected by the University of Louisville Urban Studies Institute to be 13.4 percent over the time period 2015 – 2035. The eastern part of the county is considered to have the greatest potential for future development. The southwestern area of the county (the DRG WQTC service area) is not anticipated for large residential or commercial developments.

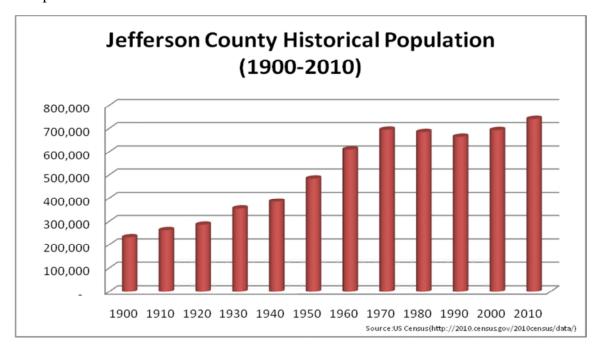


Figure 4-1 Census Data Populations for Jefferson County

4.2 CURRENT AND PROJECTED POPULATIONS

The University of Louisville Urban Studies Institute includes the Kentucky Data Center, which provides United States Census Bureau population data and projects future population growth. Figure 4-2 shows the projected growth in the DRG WQTC service area and the wet weather

Section 4 October 2017



diversion area. The dry weather service area is projected to grow from approximately 202,000 people to approximately 218,000, an 8 percent increase over the next 20 years. The total service area is projected to grow from approximately 212,000 people to approximately 228,500, 7.8 percent over the next 20 years for the full service area. Note that this is the change in population, not the net change in customers. The growth in MSD customers served by the DRG WQTC is anticipated to grow at a slightly higher rate due to the elimination the conversion of properties currently on septic tanks to full sewer service. See Figure 4-3 for a map of existing MSD sewer connections.

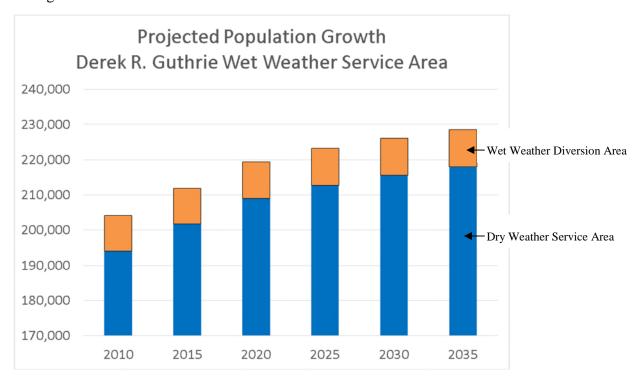


Figure 4-2 DRG WQTC Service Area Population Projections

4.3 CURRENT AND PROJECTED INDUSTRIAL USERS

There are twenty (19) General Discharge Permitted (GDP) and Significant Industrial Users (SIU) listed in Table 4-1 that discharge process wastewater to DRG WQTC. Federal categorical industries that discharge pretreatment categorical wastewater are Metal Finishers (40 CFR 433), Centralized Waste Treatment (40 CFR 437), Aluminum Forming (40 CFR 467), and Organics, Chemicals Plastics and Synthetic Fibers (40 CFR 414). All permitted industrial users have to meet applicable limits for federal categorical and/or local limits developed for

Section 4 October 2017

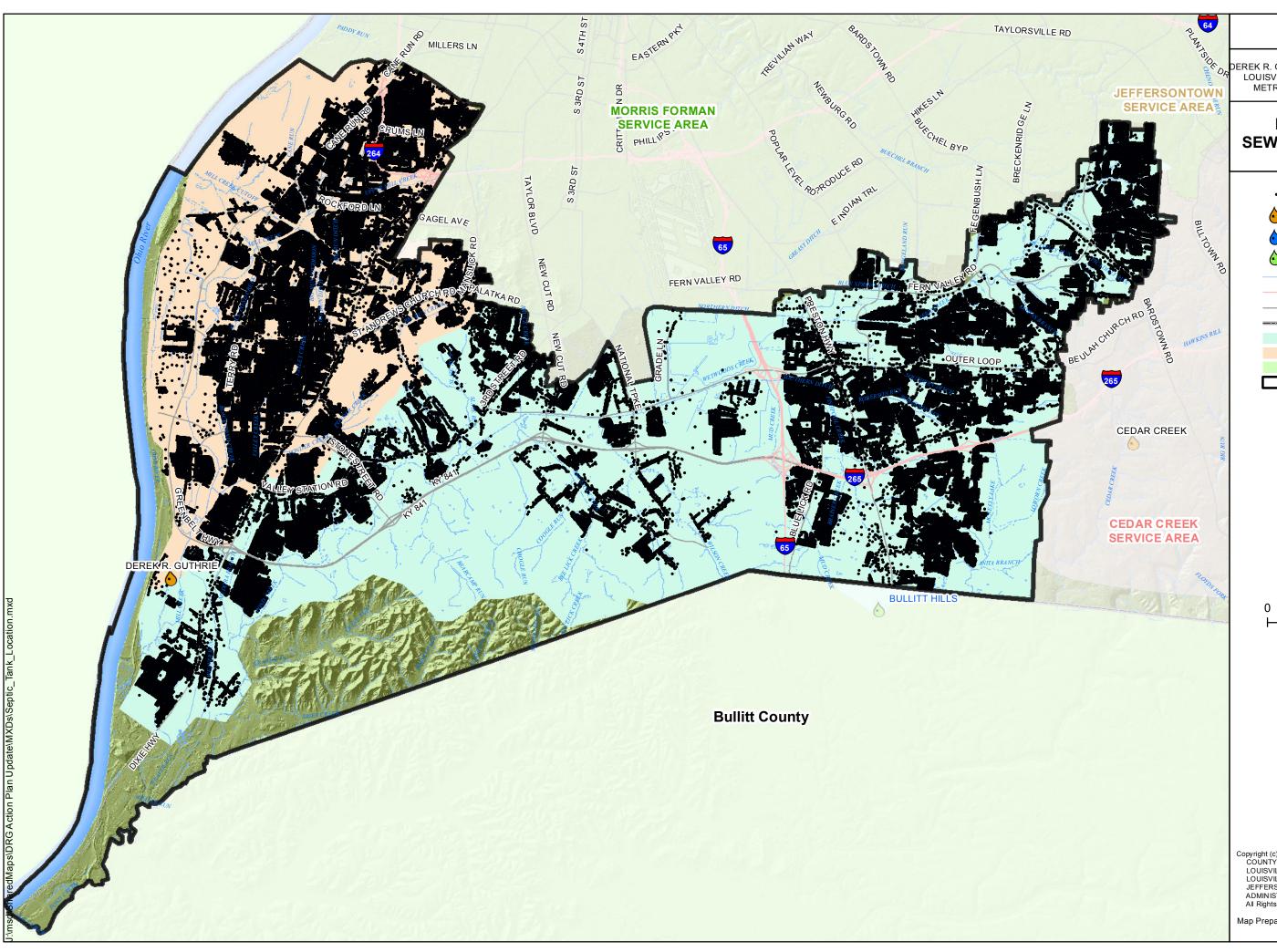


Figure: 4-3

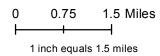
DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

EXISTING MSD SEWER CONNECTIONS













Copyright (c) 2013, LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT (MSD), LOUISVILLE WATER COMPANY (LWC), LOUISVILLE METRO GOVERNMENT, and JEFFERSON COUNTY PROPERTY VALUATION ADMINISTRATOR (PVA).
All Rights Reserved.

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017



DRG WQTC based on KPDES effluent limits and Water Quality Standards for the Ohio River. There are no projected or pending industrial developments in the DRG WQTC planning area.

Table 4-1 DRG WQTC Service Area Industrial Users

Biorigin/PTX Foods Corp	Conco, Inc.	Nth Works - Preston Plant	
Bluegrass Kesco, Inc.	Dafco Inc.	Republic Conduit	
		Manufacturing	
Interpolymer Corporation	CSX Corporation	Rivergreen Water	
Russtech Admixtures, Inc.	Interpolymer Corp.	Saint - Gobain Quartz	
Cardinal Aluminum Finishing	Kentucky Trailer	Waste Management of KY	
Cintas Corp	Multicorr	Yamamoto FB Engineering	
NHK Spring Precision			

4.4 ECONOMIC OR SOCIAL BENEFIT

By developing the RFP for projected sewage conveyance and treatment needs, both ratepayer and environmental interests in the community are protected. The plan identifies the infrastructure needs, general alignments and sizing necessary to safely convey raw sewage from undeveloped areas to the regional facility for treatment and discharge under a KPDES permit. The plan defines a reasonable expectation for development as a foundation for review and more detailed evaluations. This approach to future treatment and conveyance needs considers the financial and environmental burden borne by existing sewer district customers.



SECTION 5: EXISTING ENVIRONMENT

5.1 PHYSICAL FEATURES

The physical features of the DRG WQTC dry weather service area are described in this section. The features of interest are Lakes and Streams, Water Quality, Air Pollution and Geology.

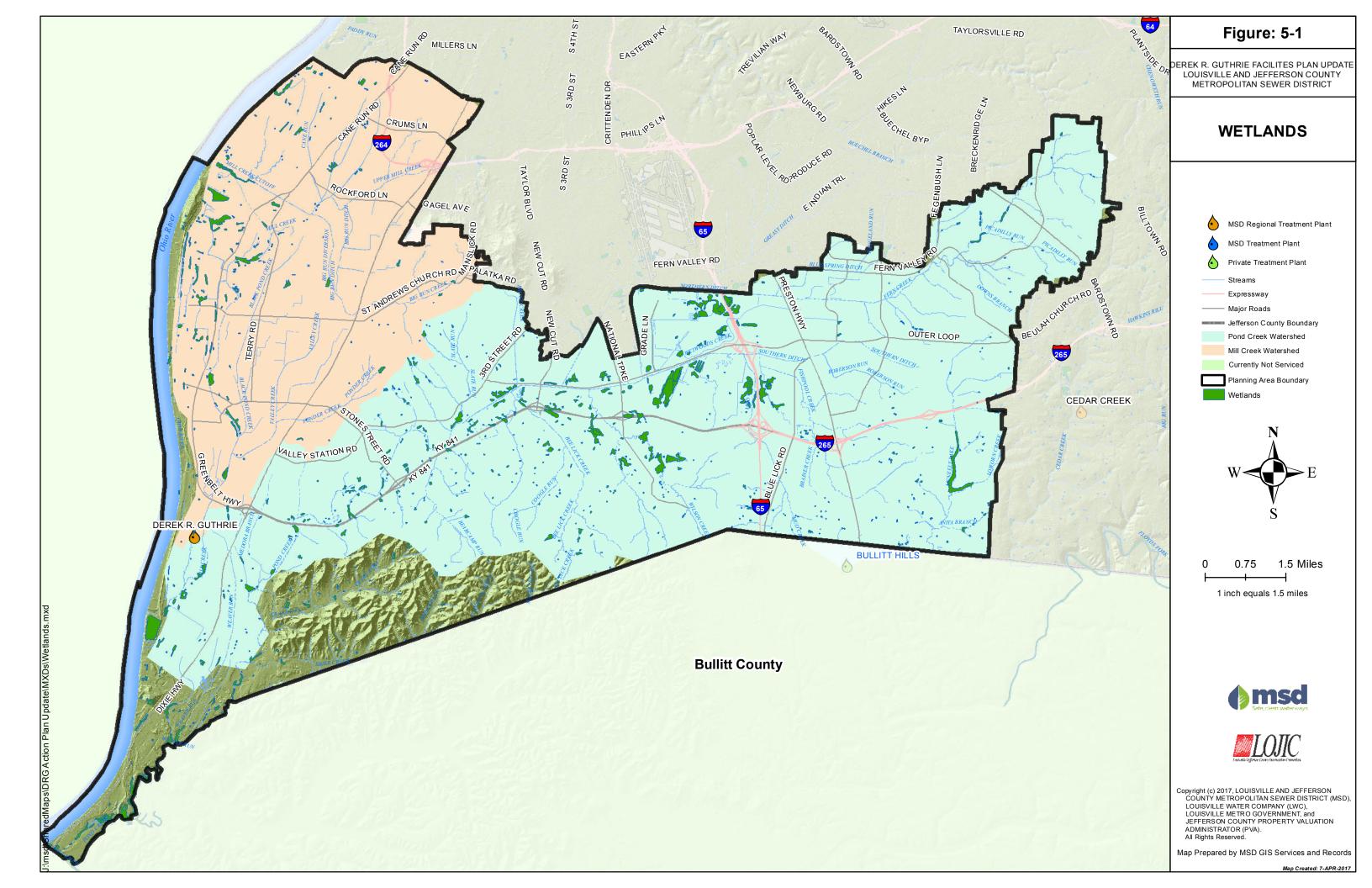
5.1.1 Lakes and Streams

The planning area flows towards the Ohio River from northeast to southwest. The major watershed streams are Mill Creek and Pond Creek. According to Louisville and Jefferson County Information Consortium (LOJIC), the planning area has 105 stream miles and 230 acres of lakes. The streams in the planning area are shown in Figure 5-1.

5.1.2 Water Quality

Water quality of the streams and lakes are monitored by the KDEP and reported to Congress through the Integrated Water Quality 305(b) report as a requirement of the Clean Water Act (CWA). The impaired streams in the planning area are shown in Figure 5-2. The 303(b) (Table 5-1) list identifies impaired and threatened waters based on KDOW's water quality monitoring, totaling 43.5 miles of impaired streams. The 303(b) list includes the stream segment, impairments, and list of potential sources. By and large, the DRG WQTC planning area was classified as impaired. The impairments listed are elevated levels of nitrogen and phosphorus (common components of fertilizers and detergents), urban runoff, diminished oxygen levels and loss of stream bank vegetation which results in warmer water temperatures. These conditions are caused by both point and non-point sources. Once a stream is listed on the 303(b) list, a total maximum daily load (TMDL) evaluation may be conducted. A TMDL is a calculation of the maximum amount of a pollutant that water body can receive and still safely meet water quality standards, and an allocation of the load among the various sources of the pollutant.

Section 5 October 2017



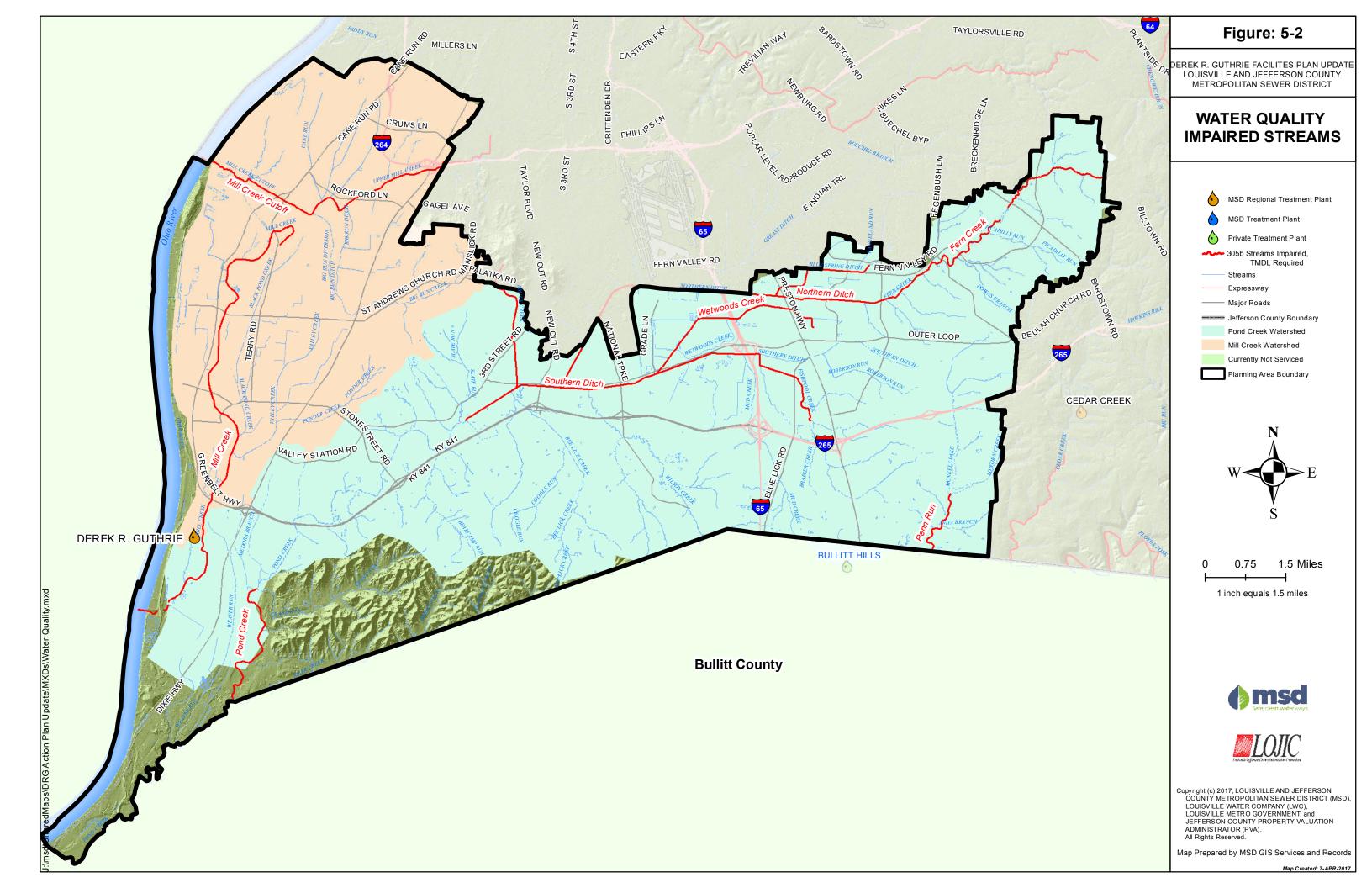




Table 5-1 303(d) Impaired Streams (2012)

Stream	Steam Miles	Impaired Use(s)	Pollutant Name	Source Name
		Primary Contact	- Chatane Hame	- Journal Harris
Blue Spring Ditch 0.0 to		Recreation Water		Municipal Point Source Discharges;
2.1	2.15	(Nonsupport)	Fecal Coliform	Urban Runoff/Storm Sewers
		Warm Water Aquatic Habitat (Nonsupport);	Fecal Coliform;	Illegal Dumps or Other Inappropriate
		Primary Contact	Nutrient/Eutrophication Biological	Waste Disposal; Landfills' Municipal
		Recreation Water	Indicators; Organic Enrichment	Point Source Discharges; Urban
Fern Creek 1.3 to 4.4	3.10	(Nonsupport)	(Sewage) Biological Indicators	Runoff/Storm Sewers
		Warm Water Aquatic Habitat (Partial Support);	Ammonia (Un-ionized); Fecal Coliform; Nutrient/Eutrophication	
		Primary Contact	Biological Indicators; Organic	Landfills; Municipal Point Source
		Recreation Water	Enrichment (Sewage) Biological	Discharges; Unspecified Urban
Fern Creek 0.0 to 1.3	1.22	(Nonsupport)	Indicators	Stormwater
		Warm Water Aquatic Habitat (Partial Support);	Fecal Coliform;	Illegal Dumps or Other Inappropriate
		Primary Contact	Nutrient/Eutrophication Biological	Waste Disposal; Municipal Point
		Recreation Water	Indicators; Organic Enrichment	Source Discharges; Urban
Fern Creek 4.4 to 5.9	0.84	(Nonsupport)	(Sewage) Biological Indicators	Runoff/Storm Sewers
		Warm Water Aquatic		Illegal Dumps or Other Inappropriate
		Habitat (Nonsupport);	Fecal Coliform,	Waste Disposal, Industrial Point Source Discharge, Municipal Point Source
		Primary Contact Recreation Water	Nutrient/Eutrophication Biological Indicators, Organic Enrichment	Discharges, Urban Runoff/Storm
Mill Creek 0.0 to 11.2	9.95	(Nonsupport)	(Sewage) Biological Indicators	Sewers
				Illegal Dumps or Other Inappropriate
Mill Creek Cutoff 0.0 to		Primary Contact Recreation Water		Waste Disposal; Municipal Point Source Discharges; Urban
6.7	5.37	(Nonsupport)	Fecal Coliform	Runoff/Storm Sewers
		Warm Water Aquatic	Ammonia (Un-ionized); Fecal	
		Habitate (Partial Support);	Coliform; Nutrient/Eutrophication	Illegal Dumps or Other Inappropriate
Northern Ditch 0.0 to		Primary Contact Recreation Water	Biological Indicators; Organic Enrichment (Sewage) Biological	Waste Disposal; Municipal Point Source Discharges; Urban
7.3	4.96	(Nonsupport)	Indicators	Runoff/Storm Sewers
		Warm Water Aquatic	Ammonia (Un-ionized); Fecal	On-site Treatment Systems (Septic
		Habitat (Nonsupport);	Coliform; Nutrient/Eutrophication	Systems and Similar Decentralized
n 10 1/0 1		Primary Contact	Biological Indicators; Organic	Systems); Package Plant or Other
Pond Creek/Southern Ditch 5.1 to 8.1	2.89	Recreation Water (Nonsupport)	Enrichment (Sewage) Biological Indicators	Permitted Small Flow Discharges; Unspecified Urban Stormwater
512 to 612	2.03	(полоциротт)	maiactors	Illegal Dumps or Other Inappropriate
		Primary Contact		Waste Disposal; Municipal Point
Southern Ditch 0.0 to	F 70	Recreation Water	Food Coliform	Source Discharges; Urban
5.9	5.78	(Nonsupport)	Fecal Coliform	Runoff/Storm Sewers
				Channelization; Commercial Districts
				(Industrial Parks); Commercial District
				(Shopping/Office Complexes);
				Highway/Road/Bridge Runoff (Non- construction Related); Impacts from
				Hydrostructure Flow
UT to Southern Ditch 0.0	2.42	Warm Water Aquatic	Coding attation (City 1)	Regulation/modification; Impervious
to 2.6	2.18	Habitat (Nonsupport)	Sedimentation/Siltation	Surface/Parking Lot Runoff
		Warm Water Aquatic		
		Habitat (Partial Support);		
		Primary Contact		Industrial Point Source Discharges;
Wetwoods Creek (Slop	l	Recreation Water		Municipal Point Source Discharges;

Derek R. Guthrie WQTC Regional Facilities Plan 2017



MSD collects and evaluates water quality data within Jefferson County. Water quality data and analysis is available through 2013. A copy of the latest Water Quality Synthesis Report for Jefferson County can be found on MSD's Project WIN website under the Consent Decree Reporting folder in the Library.

The Ohio River is hydraulically connected to the Ohio River Alluvium aquifer. Small streams in the area also influence the aquifer but to a much lesser degree than the Ohio River. Recharge to the aquifer occurs through flow from small streams, valley walls, precipitation, and infiltration from the Ohio River during high river stages and periods of high groundwater withdrawal. Discharge of the aquifer occurs to the Ohio River and production wells (Unthank, 1998).

Wetlands occur throughout the planning area and are shown in Figure 5-1. During construction of the DRG WQTC Wet Weather Treatment Project, wetlands on the plant site were marked, mitigated and/or protected during the construction period. All wetlands encountered on infrastructure projects will be similarly evaluated, marked and protected or mitigated through other jurisdictional processes.

5.1.3 Air Pollution

Air quality and water quality are linked through air pollution in our waterways. Air pollution can derive from activities such as driving cars, burning coal and manufacturing chemicals. Airborne pollutants are deposited on the land. After a rain, pollutants are transported into our water bodies. Such pollutants can be harmful to fish and other aquatic life.

The Clean Air Act, last amended in 1990, sets the national air quality standards. There are seven pollutant categories: Carbon Monoxide, Lead, Nitrogen Dioxide (NO2), Particulate Matter PM10, Particulate Matter PM2.5, Ozone (O3) and Sulfur Dioxide (SO2). If these pollutants exist in high quantities, public health concerns are raised.

In Jefferson County, the Air Pollution Control District (APCD) monitors the air quality at seven locations. There is one active site within the DRG WQTC planning area at Watson Lane collecting air pollution data on O3, SO2 and PM2.5. According to an article titled "Air Quality in Louisville: Past, Present, and Future" (2002) written by an APCD staff member, the air quality is in compliance with the National Ambient Air Quality Standards NAAQS. Air quality has improved over the past 30 years. MSD does currently hold a minor source permit for odor control devices at the DRG WQTC.

Section 5 October 2017
Existing Environment Page 3 of 6



5.1.4 Soils

Soils in a region impact the waters' ability to be absorbed into the ground. Soil types are typically categorized by three different soil textures: sand, silt and clay. If an area has predominately clay soils, there is a higher incidence of runoff. If the soils are predominantly sandy, there is a higher incidence of infiltration. There is a variety of runoff potential of soils present in the DRG WQTC planning area as shown on Figure 5-3. Figure 5-7 shows the planning area with the soils mapped with the corresponding NRCS soil classification. The soils in the DRG planning area are predominantly clay, silty clay and sand with slow to moderate runoff potential. This is due to the high clay content which reduces absorption.

Septic tank absorption fields are designed based on the rate at which the soils infiltrate the water. Sand transmits the water the fastest and clay is the slowest. A standard drain field cannot be located in clay soil. Lots with septic tanks are evaluated on a site by site basis to determine local soil conditions. Septic tank soil suitability is shown on Figure 5-4 based on ratings provided by the USGS. Based on this figure, it appears that the majority of the planning area has very limited or unrated suitability for on-site disposal systems.

5.1.5 Geology

Geology and groundwater play a role in how the surface water and groundwater interface. The amount of karst topography indicates interaction between the surface and groundwater. The groundwater is the water that seeps down through the soil until it reaches rock materials that are saturated with water. The majority of the DRG WQTC planning area is defined as non-karst with the exception of the eastern and southern portions which are shown as prone to karst formation, as shown in Figure 5-5.

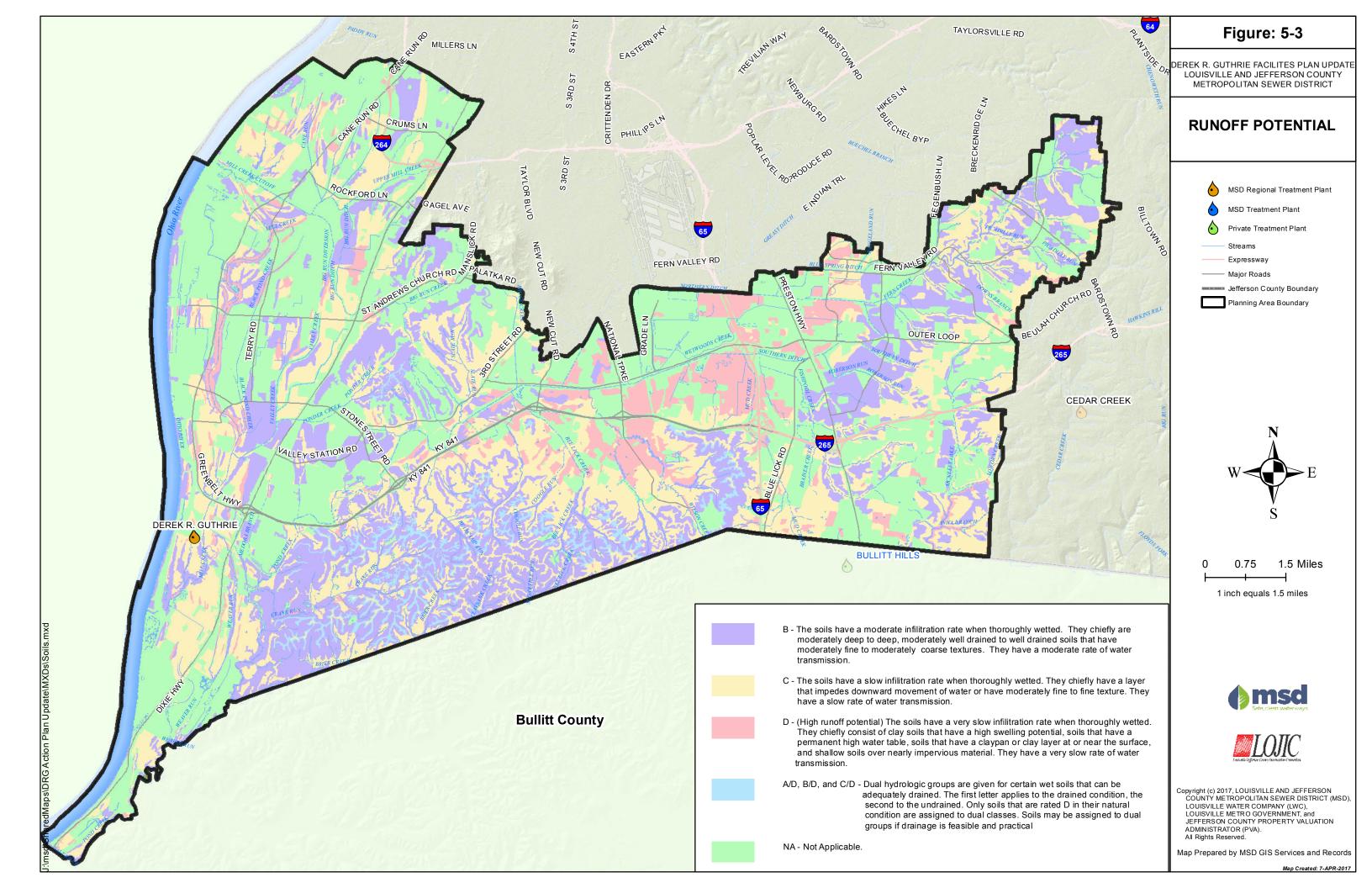
The Ohio River Alluvium is the most dependable source of groundwater for Jefferson County. Domestic wells drilled in the alluvium are generally drilled to a depth of 100 feet below ground surface and can produce approximately 1,000 gallons of water per minute. Of the domestic wells located in the upland region outside of the alluvium, less than half produce adequate amounts of water for domestic purposes and often suffer during dry periods (Davidson, 2004).

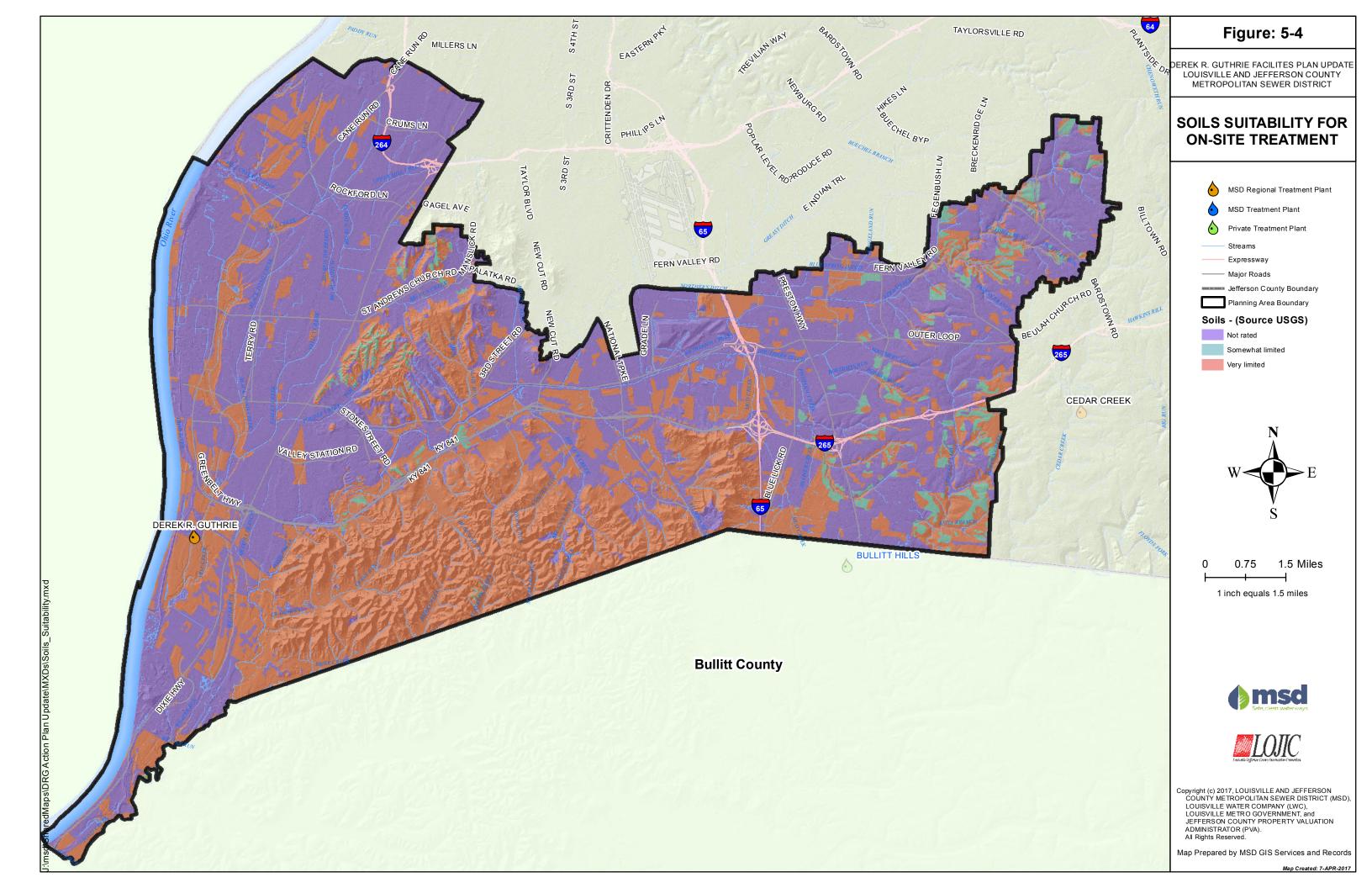
5.2 BIOLOGICAL

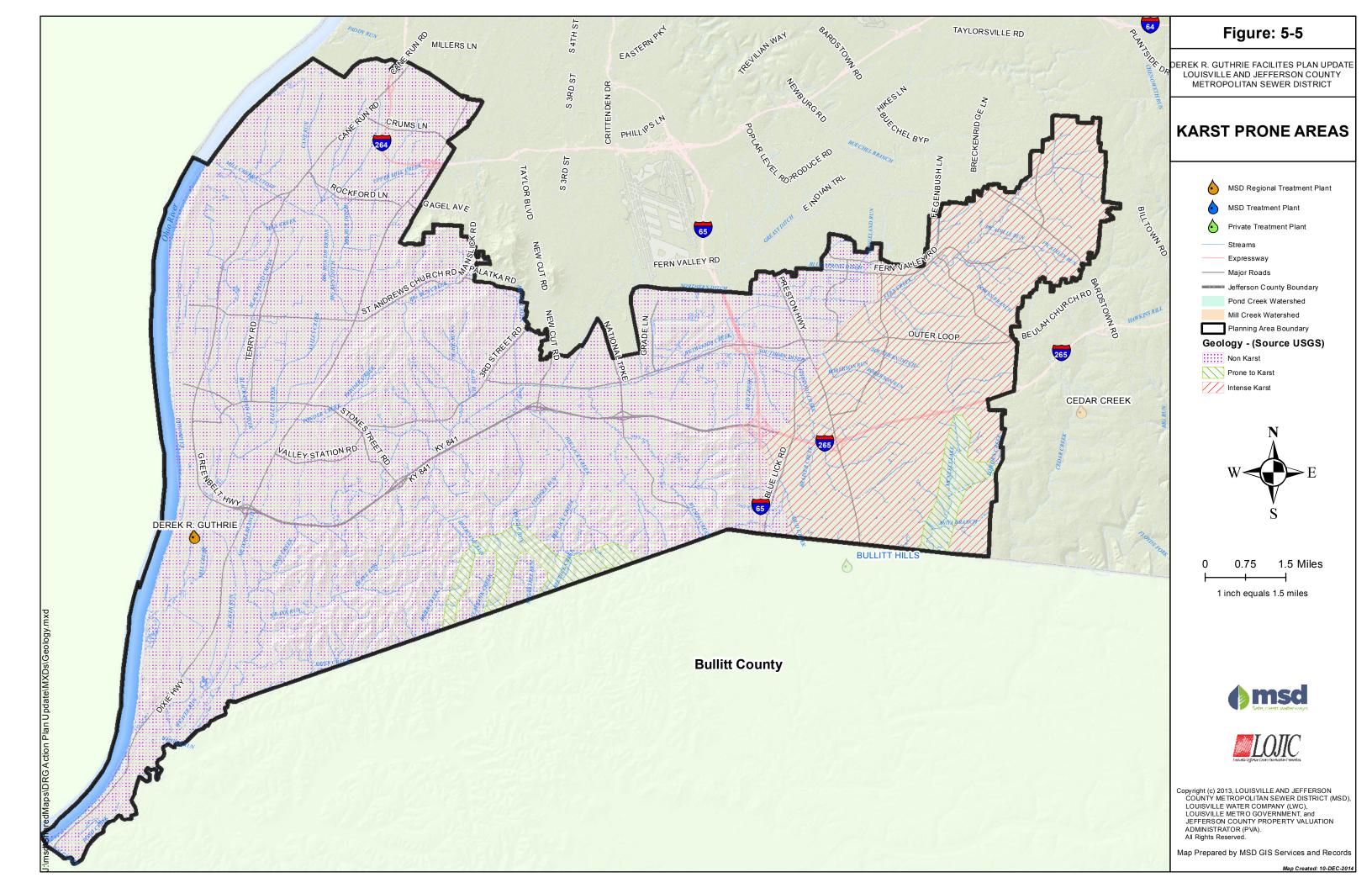
5.2.1 Plants and Animal Communities

A number of threatened and endangered species are found in Jefferson County. Species likely to be present in the planning area are the Indiana Bat, Gray Bat, and the Clubshell mussel. In the previous expansion to DRG WQTC, care was taken to avoid disturbance to the local bat

Section 5 October 2017
Existing Environment Page 4 of 6









populations during critical mating seasons. Similar measures will be implemented as necessary in all phases of development and construction identified in this RFP.

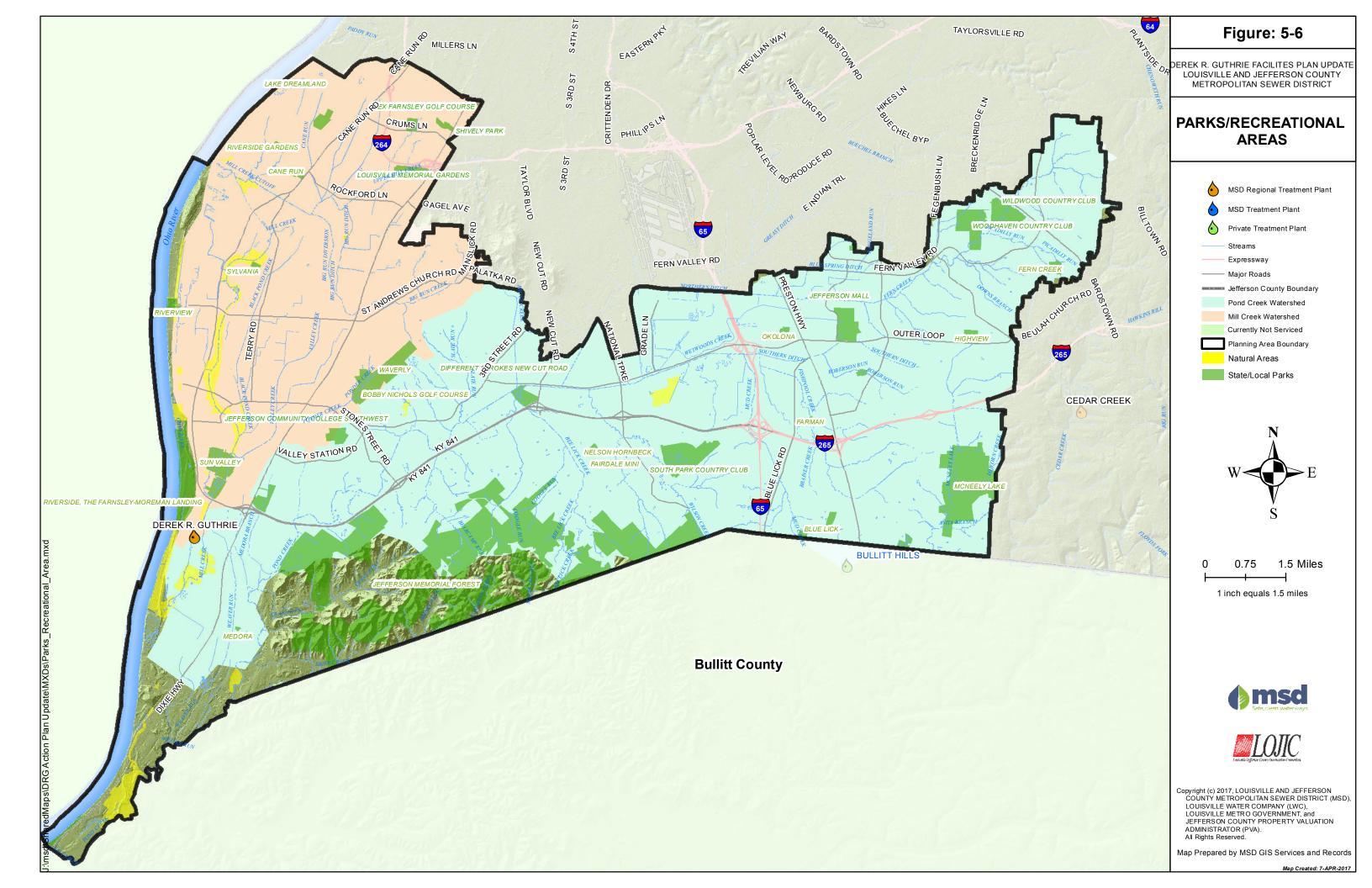
5.3 CULTURAL

5.3.1 Archaeological and Historic Resources

All required surveys will be completed for all planned projects prior to application for construction permits. The planned projects are not expected to disturb historic or archeological resources. Subject surveys and reports for any project within a 2 year window from the submission of this FPU will be attached in appendices to this report.

5.4 OTHER FEATURES

State Parks, Recreation areas, environmentally sensitive areas are listed in Table 5-2 and is shown in Figure 5-6.



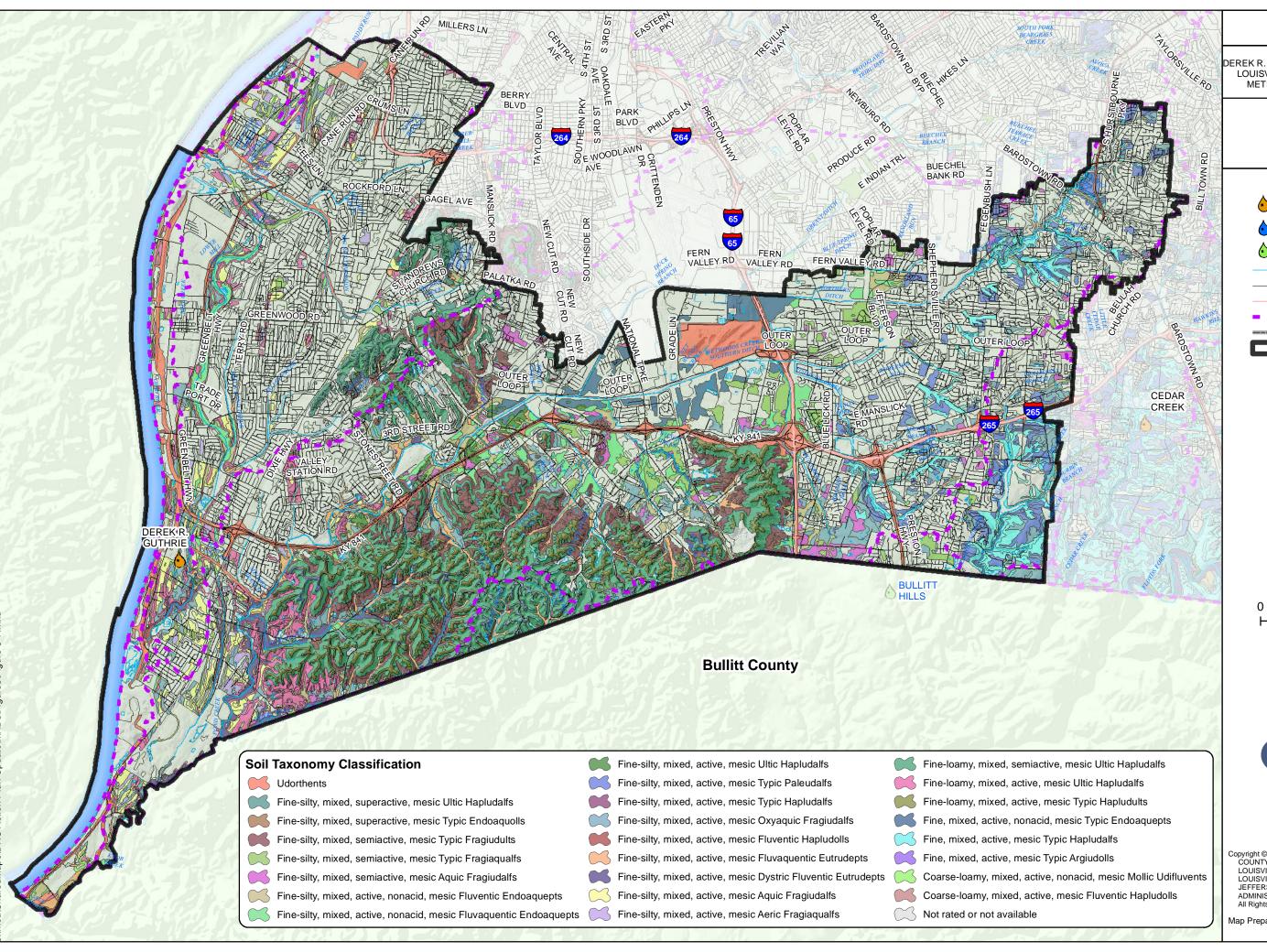


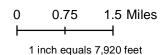
Figure: 5-7

DEREK R. GUTHRIE FACILITES PLAN UPDATE LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT

DRG SOILS











Copyright © 2017, LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT (MSD), LOUISVILLE WATER COMPANY (LWC), LOUISVILLE METRO GOVERNMENT, and JEFFERSON COUNTY PROPERTY VALUATION ADMINISTRATOR (PVA). All Rights Reserved.

Map Prepared by MSD GIS Services and Records

Man Croated: 0/27/201



Table 5-2 State, Local Parks and Recreational Areas

Name	Type	ACRES
Alex Farnsley Golf Course	Recreation	27
Bethany Memorial	Cemetery	61
Black Mudd	Neighborhood Park	18
Blue Lick	Community Park	21
Blue Lick Optimist Park	Community Park	23
Bobby Nichols Golf Course	Recreation	109
Cane Run	Neighborhood Park	11
Different Strokes New Cut Road	Recreation	68
Fairdale Mini	Neighborhood Park	0.4
Farman	Neighborhood Park	4
Fern Creek	Community Park	30
Green Meadows Cemetery	Cemetery	50
Highview	Community Park	40
Jefferson Memorial Forest	Regional Park	4,974
Kulmer Reserve	Community Park	24
Lake Dreamland	Neighborhood Park	1.4
Louisville Memorial Gardens	Cemetery	56
McNeely Lake	Major Urban Park	741
Medora	Neighborhood Park	4
Nelson Hornbeck	Neighborhood Park	19
Okolona	Neighborhood Park	15
Penn Run Golf Course	Recreation	28
Resthaven Cemetery	Cemetery	1
Riverside Gardens	Neighborhood Park	10
Riverside, The Farnsley- Moreman Landing	Major Urban Park	301
Riverview	Community Park	46
Roberson Run	Neighborhood Park	14
Shively Park	Community Park	21
South Park County Club	Recreation	268
Sun Valley	Community Park	39
Sun Valley Golf Course	Recreation	166
Sylvania	Neighborhood Park	11
Waverly	Major Urban Park	188
Wildwood Country Club	Recreation	141
Woodhaven Country Club	Recreation	184
	TOTAL	7,700

Section 5 October 2017
Existing Environment Page 6 of 6